

## Reducing tread separation in tires

In seeking a non-provisional patent, I claim two improvements in existing production lines for manufacturing continuous synthetic filaments that are woven into yarns and cords used in the manufacturing; and additional treatment for steel wires also used in tire manufacturing.

0001. In current methods, spinnerettes, through which viscous fluids flow, are used to produce continuous synthetic filaments which are woven into yarns and cords for tires. My claim here spinnerettes with much smaller diameter holes made by tiny laser beams of high intensity. These holes are irregular in shape, similar to those made by a welding torch in steel. The smaller holes with irregularities form continuous filaments with corresponding surface irregularities resulting in stronger cord-to-rubber bonding extending tire life and reducing tread separation.

0002. Also, I claim by installing sonic generators of optimum frequency (continuous or pulsed) of very low amplitude in the rear of the spinnerette housing will produce circumferential ridges and valleys in the spun filaments with further increases in cord-to-rubber bonding and resultant reduced tread separation in tires. This sonic generator can be added to present production lines to reduce tread separation.

0003. In this treatment my claim is to acid etch the steel wires. The wires at the end of the production line are loosely wound in coils and immersed in acid bath for an optimal period of time to produce an etched glass appearance in the wires. The coils are next immerse in a caustic solution, then washed in water and dried. The resulting stronger wire-to-rubber bonding further reduces tread separation in tires. This treatment can be used now in present production lines.

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